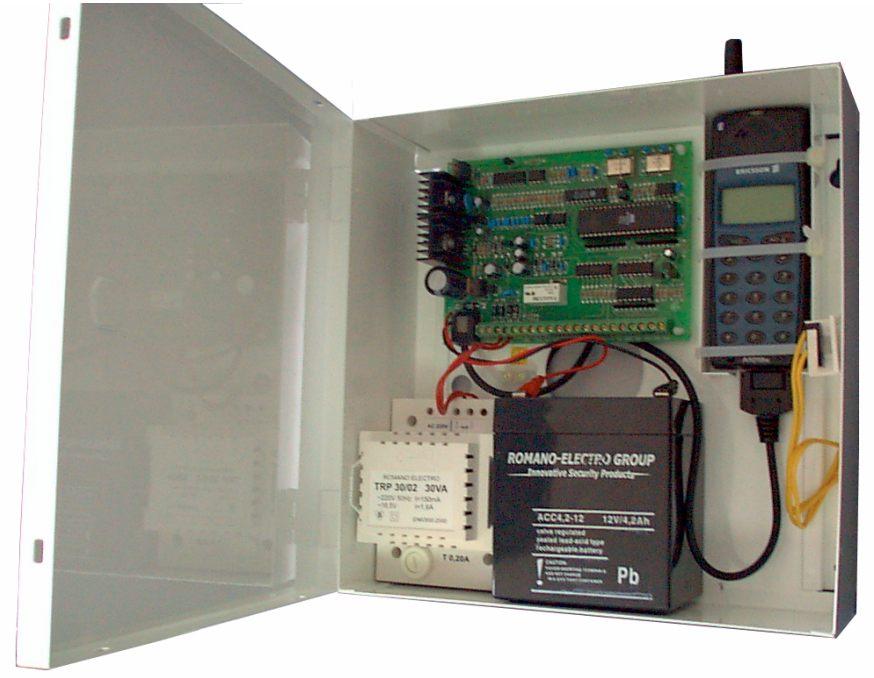
GSM-21T

GSM communicator for Ericsson A1018



Hook up, Installation and Programming Manual

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GENERAL FEATURES

GSM-21T is a GSM communicator mounted in a metallic case. Inside the case there is a $220V_{ac}$ transformer, a back-up battery, and a compartment where the mobile phone (from Ericsson family - see „Usable GSM phones") is to be placed, allowing the antenna to get out of the case.

GSM-21T communicator can be used as an accessory for a burglary control panel with digital communicator or as a stand-alone alarm unit.

GSM-21T communicator can be connected to a burglary control panel, as backup for the telephone line in case it is faulted, or directly, in case of missing telephone line. Thus, the communicator provides a higher security level for objectives protected by burglary alarm systems.

In case the control panel transmits events (in DTMF formats), the GSM module receives and codifies them, while the GSM phone transmits them to the GSM monitoring station, which must have a GSM interface. This GSM interface decodes the signal transmitted by the communicator GSM phone. The GSM interface is produced by Romano Electro Int'l Company, as an accessory for the Xwatch DPC-08 monitoring station.

The owner of the burglary alarm system can optionally get SMS-formatted event description on his/her own GSM phone.

GSM-21T communicator can be used in all GSM telephone networks, selected through the acquired SIM card.

GSM-21T communicator is totally compatible with the burglary control panels in Cerber, XL, Paradox families, etc.

Parameter programming is performed by means of the GSM phone.

Applications of the GSM-21T communicator

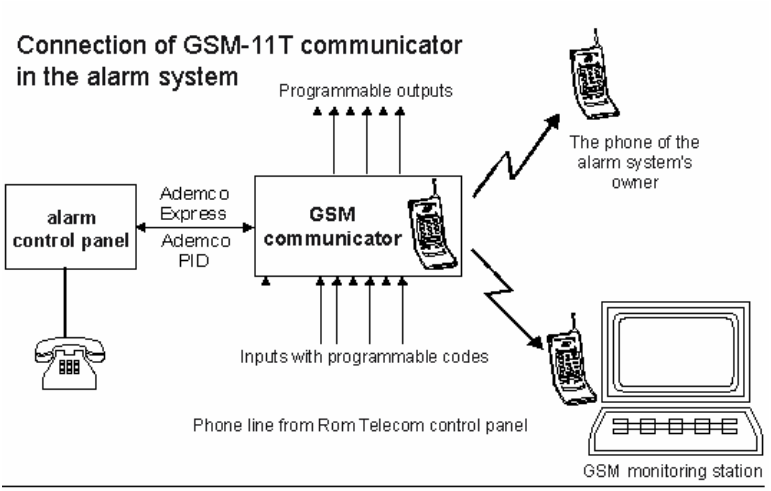
GSM-21T communicator was designed to be used in one or several situations below:

- an alarm system with a digital communicator can function more securely if a GSM-21T module is added. This module notices if the phone line is missing (by accident or intentionally) from the alarm system, takes the control panel's events and drives them to a GSM monitoring station (phone line back-up). Thus, the alarm system is never vulnerable and will transmit any event to the monitoring station in real time;
- an objective protected by an alarm system with digital communicator, for which a phone line is not available (remote villas, depots) can report system events to a monitoring and intervention for a lower cost compared to the radio monitoring;
- an application for event transmission regarding some inputs status when no alarm system is needed (panic buttons, etc.);
- **an application for input remote control, using the own mobile phone (turning on central heating, light, etc.) – under construction.**

Note: for the first 3 cases, appropriate events can be transmitted not only to a monitoring station but also onto the own mobile phone, through clear messages in

SMS format – example: “for the objective with code 0261, an alarm was detected on zone 2, disarm by code 1.”)

The next image describes functions of this communicator:


Connection of GSM-11T communicator in the alarm system
Programmable outputs
The phone of the alarm system's owner
alarm control panel
Ademco Express
Ademco PID
GSM communicator
Inputs with programmable codes
Phone line from Rom Telecom control panel
GSM monitoring station

Functions of GSM-21T communicator

The digital GSM communicator performs several functions:

- detects loss and restoring of the phone line which the burglary control panel is connected to, and forwards these events;
- supervises the phone line; in case that one gets faulted, the communicator will generate the line tone, taking the events occurred at the control panel and retransmitting them through the GSM network:
  - in digital format, to a GSM interface monitoring station
  - optionally, clearly, as SMS messages, onto a different mobile phone (i.e. on the mobile phone of the burglary control panel-protected objective’s owner);
- provides 6 individual inputs to which sensors can be connected (burglary, fire, etc), allowing the independent usage of the GSM communicator when the burglary control panel is missing;
- transmits a periodical test, with a programmable period;
- transmits a code in case of weak GSM signal;
- detects mobile phone shutting down and commands its turning on.

Functioning modes of the GSM-21T communicator

GSM-21T communicator can function in 3 ways:

- it transmits events occurred at the objective protected by the burglary control panel only to a GSM monitoring station (Xwatch DPC-08);

- it transmits events occurred at the objective protected by the burglary control panel only as SMS messages to the mobile phone of the objective's owner;
- it transmits events occurred at the objective protected by the burglary control panel both to a monitoring station and as SMS messages as well, to the mobile phone of the objective's owner.

Define the phone number of the monitoring station and/or of the mobile phone of the alarm system's owner within the configuration SMS in order to select the functioning mode.

Events generated by the burglary control panel are taken and forwarded to the monitoring station and/or the mobile phone of the client. The message containing these events also contains the control panel's account number.

If the regular phone line is present, the events are directly sent on the phone line (being ignored by the communicator). If the regular phone line is not present, the events are taken by the communicator and redirected through GSM.

The events generated by the communicator are: phone line loss/restoring, communicator's local inputs activation/deactivation, weak GSM signal and periodical test. A 4 HEX digit account number should be defined for these events. These events (generated by the GSM communicator) are transmitted through GSM, irrespective of the phone line status.

TECHNICAL FEATURES

DTMF communication formats of the alarm control panel

- ADEMCO Express 4x2;
- Contact ID (PID)

Available inputs and outputs

- 6 inputs with programmable codes for activation and deactivation;
- 6 "open collector" outputs, used for automations (upon construction).

Functioning indicators

The module has got a green signaling LED, indicating GSM phone presence and proper functioning;

Consumption

- supply voltage: mains - $220V_{ac}$; 12V / 4A rechargeable battery;
- maximum current consumption @ $12V_{dc}$ (including GSM phone loading): 500mA;
- average current consumption @ $12V_{dc}$ (loaded GSM phone): 40mA.

Note: The GSM phone connected to the GSM module is loaded from the module.

GSM network specifications

- can be used in any GSM authorized network

Usable GSM phones:

- Ericsson A1018s, T28.

Other technical features

- average duration of GSM communication: 8s;
- active inputs by: GND;
- maximum current at "open collector" outputs: 500mA.

WARNING:
For this present version, the software in the GSM communicator does not allow using the GSM phone connected to the GSM module (in function) for vocal phone communications. Hence, if this GSM phone is used simultaneously for conversations, the proper functioning of the GSM communicator is no longer assured. **The mobile phone of the communicator is recommended to be used for this application exclusively.** Its client number must not be disclosed as someone could call it. However, if the phone must be used for an emergency, the phone should be programmed as the client number is not displayed on the called phone display.

The GSM hardware was designed to allow more developed versions of the software (free of charge upgrades) in the future. These versions will allow implementations of automation commands on the present hardware (6 outputs at the most), and remote process supervision (6 inputs at the most).

The present software version of the GSM communicator allow its usage together with Xwatch DPC-08 monitoring station produced by Romano Electro Int'l, and SMS message transmission on the mobile phone of the burglary control panel protected objective's owner.

GSM phones with versions older than 1999 must not be used. The software version of the mobile phone can be read if successively pressing the next keys: "→" "*" "←" "← " "*" "← " "*".

INSTALLATION

The GSM-21T will be connected between the burglary control panel and the GSM phone.

GSM-21T installation

The connectors' order, from left to right, is the next:

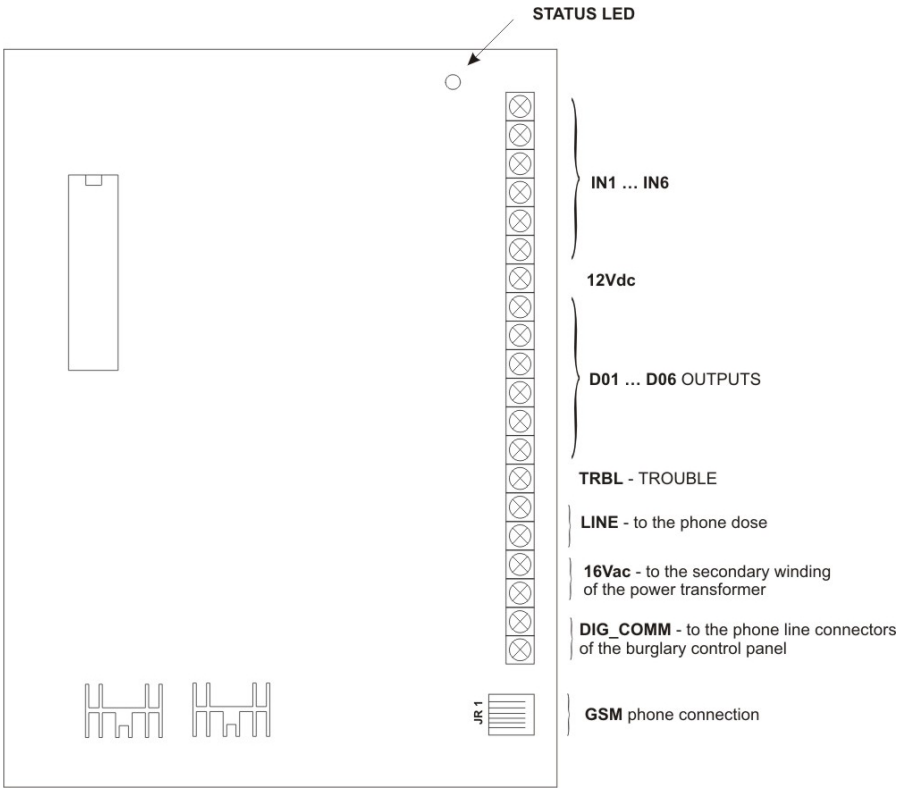
- JR1 - 6 pin connector: the cable is connected to the GSM phone;
- DIG_COMM: must be connected to the phone line connectors of the burglary control panel;

- 16VAC: must be connected to the secondary winding of the power transformer;
- LINE: must be connected to the phone dose;
- TRBL: output; it goes high if telephone line is not OK;
- DO1 … DO6: automation outputs (upon construction);
- 12VDC:12V output;
- IN1 …IN6: automation inputs.

Note:

If the green LED does not turn on or the GSM communicator is supposed not to function, do the next:

1. shut the GSM module down (both mains supply and 12V battery), and disconnect the GSM phone (JR1);
2. shut the GSM phone down;
3. wait for at least 10 seconds;
4. restart the GSM phone;
5. check if the local SMS message in the GSM phone can be read. In case a “Please wait” or similar type message does not show up, wait for 5 seconds and try to read the SMS message again. This sequence will be repeated until the SMS can be read.
6. connect the phone to the GSM module (connector JR1) and power up the GSM module. The green LED should turn on (after 2…8s).


STATUS LED
IN1 ... IN6
12Vdc
D01 ... D06 OUTPUTS
TRBL - TROUBLE
LINE - to the phone dose
16Vac - to the secondary winding of the power transformer
DIG_COMM - to the phone line connectors of the burglary control panel
JR 1
GSM phone connection

Connection Scheme for GSM-21T

GSM-21T programming

Note: Before programming the GSM module, program the burglary control panel to phone line transmit events in DTMF formats (*Ademco Express* or *Ademco PID*) to the monitoring station.

All parameters of the GSM module will be programmed from the GSM phone keypad:

- optionally, the phone number of the monitoring station in case events are to be transmitted to the monitoring station;
- optionally, the phone number of a different mobile phone (i.e. of the protected objective's owner) for SMS messages associated to events;
- client's account for events generated by the GSM communicator;
- codes generated for phone line loss and restoring;
- codes generated in order to activate / deactivate the communicator's inputs;
- code generated to make the GSM signal weaker;

- code generated for the periodical test.

Notes:

1. SMS messages are implicit and automatically generated. Message issuing is not allowed in this software version.
2. SMS messages are available only for Ademco Express 4x2 format.
3. The meaning of sent codes associated to the events occurred was implemented in this software version of the GSM communicator, according to the table below:

Event and zone/user code	**Event denomination**	**SMS message**
00	communicator input 1 activation	TRIG1 ON
01	communicator input 1 deactivation	TRIG1 OFF
02	communicator input 2 activation	TRIG2 ON
03	communicator input 2 deactivation	TRIG2 OFF
04	communicator input 3 activation	TRIG3 ON
05	communicator input 3 deactivation	TRIG3 OFF
06	communicator input 4 activation	TRIG4 ON
07	communicator input 4 deactivation	TRIG4 OFF
08	communicator input 5 activation	TRIG5 ON
09	communicator input 5 deactivation	TRIG5 OFF
0B	communicator input 6 activation	TRIG6 ON
0C	communicator input 6 deactivation	TRIG6 OFF
0D	GSM signal weakening	trouble with the GSM network
F0	Trouble	AUX loss
E0 Restoring	AUX restoring	
F7	Trouble	220V loss
E7	Restoring	220V restoring
F8	Trouble	Discharged battery
E8	Restoring	Loaded battery
F9	Trouble	Siren loss
E9	Restoring	Siren restoring
FB	Trouble	Phone line loss
EB	Restoring	Phone line restoring
1x	Fire	Fire alarm
2x	Panic	Panic

3x	Burglary	Alarm on zone x
4x	Medical emergency	Medical emergency
5x	Tamper	Ambush
6x	Bypassed zone	Bypass zone x
9x	Periodical Test	Periodical Test
Bx	Disarming	Disarm by code x
Cx	Arming	Arm with code x
Ex	Restoring	Zone x restoring
Fx	Trouble	Trouble on zone x
Others		Unknown code
X = zone or user number		

Programming mode:

1. Disconnect the GSM module from the power supply (both mains supply and 12V battery), if it was previously loaded.
2. Disconnect the GSM phone from the GSM module (JR1);
3. Deactivate the PIN code according to the phone user manual;
4. Enter the programming mode of the GSM phone, in menu “Mail”, then “Send Message”;

Example for Ericsson A1018s:

Buttons “←” and “→” are for scrolling command menus and sub-menus on the same level.

Button “Yes” is used for entering the submenus of the current command menu.

Button “No” is used to exit the current menu and return to the main menu.

Keys “Yes” and “No” are for positive or negative answers to current questions that the GSM phone user is asked.

- press keys “← ” then “Yes” in order to unlock the keypad (if the case);
- press key “← ” twice. Menu “Mail” appears.
- press key “Yes”. Menu “Read messages” appears.
- press key “→”. Menu “Send message” appears.
- press key “Yes”. Sub-menu “New” appears.
- if the GSM phone has not been used to program the GSM module before or if the GSM phone does not contain any SMS for GSM communicator setting (programming):
  - press key “Yes”.
- if the GSM communicator is reprogrammed or if there is a GSM module programming SMS in the GSM phone:
  - press key “→” once or several times until the configuration SMS appears on the display;

- press key “Yes”.

5. in this case, a configuration SMS will be created, having the next structure:
   - ***the phone number of the monitoring station*** (it can miss in case events are not to be transmitted to the monitoring station)
   - **,** (comma)
   - ***the phone number for SMS messages*** (it can miss in case SMS messages are not to be transmitted)
   - **,** (comma)
   - ***client’s account*** (4 HEX digits)
   - **,** (comma)
   - ***code generated by phone line loss*** (2 HEX digits)
   - **,** (comma)
   - ***code generated by phone line restoring*** (2 HEX digits)
   - **,** (comma)
   - ***code generated by activation (ground connecting) of the first communicator input*** (2 HEX digits)
   - **,** (comma)
   - ***code generated by deactivation of the first communicator input*** (2 HEX digits)
   - **,** (comma)
   - ***code generated by activation (ground connecting) of the second communicator input*** (2 HEX digits)
   - **,** (comma)
   - ***code generated by deactivation of the second communicator input*** (2 HEX digits)
   - **,** (comma)
   - ***code generated by activation (ground connecting) of the third communicator input*** (2 HEX digits)
   - **,** (comma)
   - ***code generated by deactivation of the third communicator input*** (2 HEX digits)
   - **,** (comma)
   - ***code generated by activation (ground connecting) of the fourth communicator input*** (2 HEX digits)
   - **,** (comma)
   - ***code generated by deactivation of the fourth communicator input*** (2 HEX digits)
   - **,** (comma)
   - ***code generated by activation (ground connecting) of the fifth communicator input*** (2 HEX digits)
   - **,** (comma)
   - ***code generated by deactivation of the fifth communicator input*** (2 HEX digits)

- **,** (comma)
- ***code generated by activation (ground connecting) of the sixth communicator input*** (2 HEX digits)
- **,** (comma)
- ***code generated by deactivation of the sixth communicator input*** (2 HEX digits)
- **,** (comma)
- ***code generated by GSM signal weakening*** (2 HEX digits)
- **,** (comma)
- ***code generated by the periodical test*** (2 HEX digits)
- **,** (comma)
- ***duration (in hours) the periodical test is performed at*** (2 decimal digits)
- **.** (period)

Note: All fields previously defined will be filled in, but the phone numbers (eventually). If the first phone number (of the GSM monitoring station) is present in the configuration SMS, the communicator will transmit certain events to the monitoring station. If the second phone number is programmed, the communicator will transmit SMS messages to this second phone number.

A typical example of a configuration SMS message:

0744111111,0744212223,123A,FB,EB,00,01,02,03,04,05,06,07,08,09,0B,0C,0D,90,10.

By this SMS, the GSM communicator is programmed to transmit its own and the burglary control panel generated event codes to the monitoring station with the phone number 0744111111. SMS messages associated to events will be transmitted onto the mobile phone number 0744212223.

Codes generated by the burglary control panel will keep the client's account number settled in the control panel. Events generated by the communicator will have the account number 123A.

Upon phone line loss and phone line restoring, respectively, the communicator will generate codes FB and EB, having the account number 123A.

Upon activation, deactivation of the 6 inputs of the communicator, codes 00, 02, 04, 06, 08, 0B, and 01, 03, 05, 07, 09 and 0C, with account number 123A, will be generated.

Upon GSM signal weakening, the interface will transmit code 0D settled in the configuration SMS to the monitoring station.

The interface transmits code 90 for the periodical test. The duration for the periodical test performing is 10 hours.

Note: Changing codes associated to events in the configuration SMS, will trigger the appropriate interpretation of events associated to these codes. For example, if the 6th parameter is programmed 38 instead of 00, then, upon activation of the first communicator input, an „Alarm on zone 8" SMS type will be transmitted (instead of TRIG1 ON), while the monitoring station will consider the event of the same type.

Any change of the configuration SMS is accompanied by a restart of the GSM module.

Note:

Format DTMF 4x2 describes events in such a manner that necessary information is presented by means of 6 HEX digits “AAAAEZ”, where:

- “AAAA” is the client’s account number;
- “E” is the event code;
- “Z” is the zone/user number

For format Ademco PID, the interface will not generate clear SMS messages.

Notes:

In the edit mode, digits can be obtained directly, by pressing the corresponding keys longer.

The comma and period can be obtained by successively pressing key “1”.

Upon editing, each key is used for several symbols: i.e. letter „C” is obtained by successively pressing key “2” for 3 times.

Press shortly key “*” in order to switch from capital to small letters or vice versa; “*” also modifies the last edited character from capital to small letter or vice versa.

Keys “→” and “←” are used to move the slide to the right and left within the edited message. By long pressing these keys, the slide is directly moved to the beginning or end of the edited message.

Key “CLR” (Clear) is used to delete the character on the right or left of the slide.

6. Save this SMS, with no destination phone number, in the phone memory (not the card’s);

Example for Ericsson A1018s:

In the edit mode, after the configuration message was edited, press key “Yes”. The destination phone number will be answered to with “NO”. If there is the case, to modify an existent message, answer with key „NO” to the “Store?” and “Erase?” questions.

Note: **There must be only one message stored in the mobile phone that is the configuration SMS message. Older messages must be erased. The number of SMS messages in the card’s memory is not restricted.**

Example for Ericsson A1018s:

- press keys “← ” then “Yes” to unlock the keypad (if there is the case);
- press key “← ” successively for 2 times. “Mail” menu will show up.
- press key “Yes”. “Read messages” menu will show up. Press key “Yes”.
- press key “← ” or “→” until the message to be erased was found.
- press key “Yes”. Enter the message reading mode. If the current message is not the one to be erased, press key „NO” and restart looking it up. If the current message is the one to be erased, press key “CLR”. Press key „YES” to answer “Erase?” question. In case “Store?” question shows up, answer “No”.

- press „NO” to exit the submenu.

7. Exit the mobile phone programming menu;

Example for Ericsson A1018s:

Press key „NO” for several times until the general message is displayed (indicating the used GSM network, and the current time and date, eventually).

8. connect the phone to the GSM module (JR1).

9. Power up the GSM module.

In case of modifications, modify the configuration SMS, save it and erase the old one. **Do all these when the GSM module is not powered.**

GSM phone from Ericsson family in accordance to the technical specifications is not for delivery purposes. It can be acquired from the GSM network distributors agreed by the beneficiary. Each user can choose the favorite type of subscription and GSM network.